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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,460	08/07/2001	Herve Lescuyer	01115	6367

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EXAMINER	
MENON, KRISHNAN S	

ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/856,460	LESCUYER ET AL.	
	Examiner	Art Unit	
	Krishnan S Menon	1723	

-- The MAILING DATE of this communication appears on th cover sh t with th correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claims 1-9 and 11 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1,2,4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al (US 3,172,757) in view of Rieger et al (US 4,690,763)

Hess teaches a method of filtration for liquid metals comprising passing the liquid metal through a bed of refractory particulate material (col 2 lines 26-54, tables, figures) as in claim 1.

Hess does not teach the porosity of the refractory particles. Rieger teaches the porosity of the hollow refractory particles (see col 2 lines 60-63; col 2 lines 34-48). {Rieger teaches the overall density of the filter bed as about 25% of the ceramic material density (col 2 lines 34-35), which means that the overall porosity is about 75%. Overall porosity includes the space between the particles and the pores within the particles. Of this, about 45% is space between the particles (see col 2 lines 40-52, which defines porosity between the spheres as 5-45%). Therefore, the remaining 30% (75% minus 45%) is porosity within the particles.} It would be obvious to one of ordinary skill in the art at the time of invention to have porous refractory particles as taught by Regier in the teaching of Hess for improved wettability and filter capacity (Rieger: col 2 lines 15-21).

Claim 2 adds the further limitation of the residence time as being about 1 to 500 seconds. Hess does not directly teach the residence time. However, Hess teaches flow rate and bed thickness

(col 2 lines 26-54, and the table). It would be obvious to one of ordinary skill in the art at the time of invention to calculate and ascertain that the residence time is about 1-500 seconds in Hess from bed thickness and flow rate.

Claims 4 and 6 add further limitations as follows: Bed thickness is between 4 and 40 cm (col 2 lines 26-54) and particle size is between 0.2 and 20 mm (corresponding to mesh size – col 2 lines 26-34) as in claim 4. Liquid metal is selected from aluminum and its alloys as in claim 6 (col 1 lines 15-18).

2. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess (757) in view of Rieger (763) as applied to claim 1 above, and further in view of Brezny (US 5,322,821).

Claim 3 adds the further limitation of porosity being from pores of 10 microns or larger, and claim 11 adds 10-200 microns. Brezny teaches a hollow corundum particles of pore size from 10-200 microns (col 1 lines 53-57). It would be obvious to one of ordinary skill in the art at the time of invention to have a pore size of 10-200 microns as taught by Brezny in the teaching of filter bed particles of Hess in view of Rieger for improved surface area and interconnected porosity for improved capacity of the filter bed (Brezny col 1 lines 26-36).

3. Claims 5,7,8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess (757) in view of Rieger (763) as applied to claim 1 above, and further in view of Neidhardt et al (US 4,177,235).

Hess teaches material as corundum (col 2 lines 45-50). Hess in view of Rieger teaches fused corundum as in claim 5, which is cast and then granulated as in claim 7 (col 3 lines 37-45). However, Hess in view of Rieger does not specify electro-fusion for melting corundum, crushing

and sieving the particles, etc. Neidhart teaches a process of making electrically fused corundum particles of high purity (see 2 lines 3-43). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhart for making the corundum for the process of Hess in view of Regier because it would provides the details of making the corundum particles, which is only briefly described by Rieger, to make improved quality corundum particles.

Claim 8 adds the further limitation of particle porosity of 5-30%, which is taught by Hess in view of Rieger, as discussed before in claim 1. Claim 9 adds the further limitation of a device, which Hess teaches (see figures.).

Response to Amendment

The declaration under 37 CFR 1.132 filed 7/22/03 is insufficient to overcome the rejection of claims 1-9 and 11 based upon Hess in view of Rieger as set forth in the last Office action because: See response to arguments below.

Response to Arguments

Applicant's arguments filed 7/22/03 have been fully considered but they are not persuasive.

Re the 37 CFR 1.132 declaration: The examiner agrees that Dr. Le Brun is correct in his calculation of the porosity of the granules (within the granules). However, Dr. Le Brun also explains that most of this porosity within the granule is possibly from closed voids, ie, voids that are unavailable for the molten metal for filtration. If one reads the example described in the Rieger ref, col 7 lines 30-49, 82% is the total void volume of the bed, of which only 55% is available for aluminum, the molten metal filtered. Therefore, in the same line of argument as that of Dr. Le Brun, the actual volume available within the particles of the bed for filtering is much less than 55%.

If the void volume of the bed between the granules is maintained at 45% by design by Rieger, the contribution of the void volume in the bed that comes from within the granules would be 10% (the open porosity of the granules would be a bit higher than 10% as shown by Dr. Le Brun's calculations), which would overlap the range of the claimed invention. Also please note that Rieger teaches to use apparent density of 16-25% when using the hollow spheres (col 6 lines 27-30). Re Dr. Le Brun's opinion that Rieger does not teach the inner porosity of the particles to improve filtration but only to reduce the weight of the plate because Rieger teaches using hollow and solid particles interchangeably: first of all, Rieger teaches hollow particles as preferable (col 2 lines 60-65) and uses hollow spheres in the example; and secondly, Rieger teaches that the filter media of his teaching affords better efficiency, high capacity and easy to use (col 2 lines 15-21). It may be noted that the motivation to combine the references need not be what the applicant has recognized as the advantage. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Argument re Brezny ref: Brezny ref was used to show corundum with pore size of 10-200 microns. Hess in view of Rieger is silent on porosity. However, Rieger teaches using organic filler in the process of making the hollow spheres in col 5 lines 30-50, and sol-gel process in col 3 lines 53-54, which should generate porosity. Brezny teaches particles having such porosity, making such particles by similar processes, and use of such particles in metal filtering, and for the teaching that interconnected macropores facilitate fluid passage (col 1 lines 5-10 and 30-36), which would be motivation for using the ref with Hess in view of Rieger.

Argument re Neidhardt ref, it may be noted that Rieger teaches making corundum spheres 'in a manner known per se'. Neidhart ref is used to show the known process for making corundum by electrofusion, casting, crushing, etc.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon
Patent Examiner

W. L. WALKER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700